

Journal, 1868, vol. i. p. 264. I add here the descriptions of two others.

*Upeneoides Dorix.*

D.  $8\frac{1}{8}$ . A. 8. L. lat. 34.

The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head thrice and two-fifths. Interorbital space flat, its width being equal to that of the orbit, which is two-thirds of the extent of the snout. Eye somewhat nearer to the end of the snout than to the gill-opening. Vomerine teeth forming a continuous angular band. The barbels do not reach to the angle of the præoperculum. The height of the spinous dorsal fin is three-fourths of that of the body. Tubes of the scales of the lateral line very simple, bi- or trifurcate. Pinkish, with a rather narrow yellow band from the eye to the upper part of the caudal fin. Spinous dorsal with traces of alternate blackish and whitish longitudinal bands.

Several examples, 4–5 inches long, from Bender Abassi, Persian Gulf.

*Eleotris heterolepis.*

D. 6|13. A. 11.

Scales ctenoid; numerous small scales are mixed with large ones, the smaller occupying chiefly the base of the larger. Head broad, depressed as in *Batrachus*, covered with minute scales; snout and cheeks with numerous short filaments and fringes. Eyes of minute size, the distance from each other being much greater than that from the end of the snout. Teeth in the jaws in a band, villiform; but there is an outer series of larger teeth in the upper jaw, and an outer and inner in the lower. Vomerine teeth none. None of the fin-rays produced into filaments. Caudal fin wedge-shaped, rather produced, shorter than the head; the upper and lower rudimentary caudal rays numerous, extending for some distance along the caudal peduncle. Blackish brown.

Sarawak. Seven inches long.

LVI.—*The Character of the Indigenous Icelandic Terrestrial Mammalian Fauna, with especial reference to Mr. Andrew Murray's representation of it in his 'Geographical Distribution of Mammals.'* By Prof. JAPETUS STEENSTRUP\*.

THE geographical stamp presented by the animal inhabitants

\* Translated by W. S. Dallas, F.L.S. &c., from the 'Videnskabelige Meddelelser fra Naturhistorisk Forening i Kjöbenhavn,' 1867, pp. 51–66.

of a country may often be very different in the different classes of animals of which its fauna consists, inasmuch as not only may the animals of the surrounding sea or the coast-fauna belong to another geographical region than the land animals, but even of the latter, again, one class, by reason either of its mode of life, or of a stronger or weaker faculty of motion, may sometimes present striking differences from the rest. Hence it is perfectly natural that an author who seeks to explain the reasons for the present distribution of animals upon the surface of the earth should choose rather to treat geographically each class of animals by itself, and to seek to ascertain and determine with regard to each class of animals the particular country's zoogeographical character. This is just what Andrew Murray has done, in his great work, furnished with 101 fine maps, 'The Geographical Distribution of Mammals.' But if we determine the geographical character of a country or of a large island in this manner, from a single class, in this case from the mammalia alone, we certainly expose ourselves to great errors, especially when this class is very poor in species, or when its species are not very well known. A striking example of this is presented by the above-mentioned work, as regards Iceland, inasmuch as the indigenous terrestrial mammalian fauna of this island, which has a surface of nearly 2000 square miles, can only be said to consist of *a single species*; and this single species therefore is that which in this case is to decide whether Iceland belongs, in a zoogeographical sense, to Greenland and North America, as the author supposes, or to the Europæo-Asiatic region, as we have hitherto believed, whether forming our judgment upon the characters of the class of mammalia or of the other classes of terrestrial animals.

This single species therefore plays, in the important problem of the origin and diffusion of animals, a part so decisive that a single species of animal can hardly have it to fulfil in any other point. Murray has, indeed, perfectly felt this\*, and he has not come lightly to his result, but, on the contrary, after ample consideration; but, in order to carry this on in a correct manner he seems partly to have wanted a sufficient knowledge of the animal in question, and partly not to have perfectly

\* At p. 267, for example, Murray says:—"In speaking above of the long-tailed field-mouse, I reminded the reader of the nature of its habitation with some exactness, because it is the only guide we have to enable us to determine whether that species does or does not exist in Iceland, or whether, as I suppose, it is the lemming which has been mistaken for it there—a fact which, as the reader knows, must have rather an important bearing on the past geological history of that part of the northern hemisphere." The italics are mine.

understood the sources of information made use of by him. Hence I have thought it desirable to investigate the circumstances more closely—and this so much the more, as it may certainly be supposed that foreign naturalists will hit upon many of the difficulties which have led Murray astray, or at least upon some of them.

The animal which possesses this great significance is the Icelandic heath-mouse or wood-mouse, which was regarded by Thienemann as a distinct species, and described and figured by him under the name of *Mus islandicus*, Th., but which will rather be regarded by other naturalists as a variety of our common wood-mouse (*Mus sylvaticus*, Linn.\*). It is, indeed, the only land mammal which can be regarded with some probability, if not with absolute certainty, as aboriginally belonging to the country; for the other land mammals are, first, domestic animals (horses, cows, sheep, goats, pigs, dogs, and cats) introduced with the inhabitants early in the middle ages; and, in the next place, at various subsequent times two wild animals were introduced, by the interference of man, in order to people the interior of the country—namely, hares and reindeer; whilst the rat and the house-mouse have been involuntarily introduced by commerce. Lastly, icebergs bring white bears to the country, if not every year, at least very frequently; but it seems to be only quite exceptionally that this animal has remained upon the island throughout the summer. Another guest which the ice likewise seems to bring frequently is the mountain-fox, the *Melrakki* of the Icelanders (*Canis lagopus*, Linn.); and although this is one of the generally distributed and common animals over the whole country, it must nevertheless also be regarded as introduced only in the above manner.

It is therefore of importance correctly to understand the nature and origin of this mouse, which is found in the open country, pretty far from human habitations.

Murray thinks that two statements, made by Eg. Olafsen and Henderson, as to the peculiar mode of life of the Icelandic heath- or wood-mouse clearly indicate that this can only be a lemming (*Myodes*)—most likely *M. grœnlandicus*, Traill, or *M. hudsonius*, Pall.,—and that they can hardly apply by any means to the genus *Mus*, or at least to our wood-mouse

\* Whether *Mus sylvaticus*, Linn., is a collective species, and includes several nearly allied forms, is not thoroughly decided, but it is probable. E. Erslev made some remarks upon it, and upon an individual of Thienemann's *Mus islandicus* captured by me in 1839, far from human habitations, upon a heath at Rangaaen, at the meeting of Scandinavian naturalists in 1847 (see its 'Fordhandlinger,' pp. 944-945.)

(*Mus sylvaticus*, Linn.). The animals which Thienemann, and probably others, must have examined are, in his opinion, only domestic mice living at a distance from houses, whilst the mouse living in the interior of the country, to which he believes that Olafsen's and Henderson's statements referred, has hitherto remained unknown.

The statements of Olafsen and Henderson, upon which the author has thus built up a scientific conclusion of such importance, are here given one after the other *in extenso*. In Olafsen's and Povelsen's 'Travels in Iceland' (Band i. p. 218. § 329) we read as follows:—

"Mice here are numerous, but not of many kinds. The whitish ones (*hvidagtige*\*), which live in woods and heathy thickets, called *Skogar-mys* in Icelandic, seem to be only a variety of *Mus domesticus* (Linn. Syst. Nat. ed. res. 26-12) or the well-known *Mus sylvaticus*. In the wood of Huusefell there is an abundance of them. They are very good economists, and collect for the winter a quantity of *Arbutus*-berries (§ 260), which provision of theirs is often found by travellers. It is generally asserted here, by those who have seen it themselves, that they undertake journeys and conveyances over brooks and pretty large rivers, where the water is deep and still; and it appears that they shoot obliquely across streams. Their boats are dry cowdung, such as is dropped upon the fields, namely thin and flat. So many as intend to travel in company, four to six or ten at the utmost, help each other to carry their boat to the water. The cargo is a considerable heap of *Arbutus*-berries, which are piled up in the middle, but the mice sit in a circle outside them, so that their heads meet together in the middle point, but their tails hang out in the water, and are employed as oars in making the passage. When they get over, they carry their *Arbutus*-berries to a certain place. They are, however, often unfortunate, by the currents leading them into danger, when they suffer shipwreck, and have to save themselves as best they can by swimming, which art they understand pretty well. We have not ourselves seen these transits; but they are generally known; some even assert that they have seen them. When we consider the wonderful economy of the beaver and many so-called intelligent animals, this of the wood-mice cannot be regarded as incredible."

This account was made use of by Pallas, Pennant, and

\* "*Hvidagtige*," in Icelandic Danish, signifies "whitish grey" or "light grey;" the Icelanders' "grey" colour is of a somewhat darker tint than ours. It is therefore very delusive that this expression, in the English translation of Olafsen's 'Travels,' used by Murray, is rendered merely "white," instead of "whitish."

others; but W. Hooker, in his 'Tour in Iceland' (1813), expressed more than doubt as to the correctness of the statement, as he affirmed that the more intelligent Icelanders laughed at the report. Henderson's attention was in the meanwhile called to this doubtful point when he commenced his second journey in Iceland; and he endeavoured, if possible, to obtain fresh information upon it. After giving Olafsen's above-cited statement and Hooker's doubts, he proceeds as follows (Journal of a Residence in Iceland in the years 1814, 1815, and 1818, vol. ii. p. 186):—

“Having been apprised of the doubts that were entertained on this subject before setting out on my second excursion, I made a point of inquiring of different individuals as to the reality of the account; and I am happy in being able to say that it is now established as an important fact in natural history, by the testimony of two eye-witnesses of unquestionable veracity, the clergyman of Briámslæk and Madame Benedictson of Sticksesholm, both of whom assured me that they had seen the expedition performed repeatedly. Madame Benedictson in particular recollected having spent a whole afternoon, in her younger days, at the margin of a small lake on which these skilful navigators had embarked, and amused herself and her companions by driving them away from the sides of the lake as they approached them. I was also informed that they make use of dried mushrooms as sacks in which they convey their provisions to the river, and thence to their homes. Nor is the structure of their nests less remarkable. *From the surface of the ground a long passage runs into the earth, similar to that of the Icelandic houses, and terminates in a large and deep hole, intended to receive any water that may find its way through the passage, and serving at the same time as a place for their dung. About two-thirds of the passage in, two diagonal roads lead to their sleeping-apartment and the magazine, which they always contrive to keep free from wet.*”

By comparing Olafsen's statement with Henderson's, it will be easily seen that the latter is not merely a confirmation of the remarkable navigation of the Iceland mouse\*, but also gives further information as to the sacks, the dried fungi, which the mice make use of, besides adding complete and very significant information as to the burrows of these little animals. These are described as consisting of three parts: a long passage or gallery, like that of an Icelandic house, leads

\* A pictorial representation of the mode of navigation, from the descriptions of Olafsen and Henderson, is to be found in a work which may generally be consulted with advantage, 'The Pictorial Museum of Animated Nature' (vol. i. p. 63. fig. 266).

from the surface of the ground deep into the earth, and terminates in a wide and deep cesspool, destined to receive both any water that may run in and the fæces of the animals; at two-thirds of its length inwards, two passages issue from this obliquely, one on each side, one leading to the dwelling-chamber and the other to the magazine, which they always endeavour to keep dry.

It cannot be denied that a statement so particular, and apparently so founded on the observation of nature as that relating to the arrangement of the burrows, likewise casts a certain amount of credibility upon the accounts of the marvellous voyages performed by the mice on the water, in order to seek their favourite food, the *Arbutus*-berries. Inasmuch, then, as I regard the whole narrative as credible, I at once open up the question whether the sketch of the mode of life of the Iceland mouse given by Olafsen and Henderson is decidedly in favour of this animal being an Arvicoline, and especially a lemming, or even renders such a supposition to a certain extent probable; and to this I can distinctly answer no. But Murray answers it with yes, and at p. 269 of his work he speaks on this subject in detail as follows:—

“That an economic Rodent lives in Iceland, is, I think, established; but the account given of its runs and granaries makes it not less clear that it is not *Mus sylvaticus*. There is no European mouse that makes a nest in the manner described by Henderson.

“But there is an animal very like a mouse (the lemming) which does make extensive burrows: it is provided with powerful sickle-shaped claws specially adapted for digging; and although I have not met with any account of the plan on which their burrows are constructed\*, there is abundant evidence that they do make them. Captain M'Clintock says, in his diary of the expedition of the 'Fox':—'Hare-tracks are pretty common along the shore, and upon the sides of steep hills; they make burrows under the snow, but we have never found them in the earth like those of the fox and lemming.' Von Baer says that in Nova Zembla gentle declivities are frequently burrowed through in every direction by them. In fact, the habit is notorious.

“Another point in favour of the Iceland animal being a lemming is, that Olafsen speaks of it as often white. Now,

\* John Wolley mentions only simple galleries in the turf at the surface of the ground, and holes in the sides of small hills in which they dwell, and outside of which the excrements occur in large heaps (Skand. Naturf. Möde 1863, p. 217 *et seq.*).

although the *Mus sylvaticus* sometimes may be found white, when such a thing occurs it is only a case of albinism, and rare; but the lemming in America is said regularly to become white in winter, although not so completely so as the weasels. Both in Spitzbergen and Nova Zembla a little white animal has been observed. MM. Pachtisson and Ziwolka, during their winter stay in Nova Zembla, saw a little white animal in their hut, which they, in their journal, call a mouse. According to Mr. Ziwolka it was larger than a common domestic mouse, and therefore could not have been a white individual of that species; it was doubtless a lemming. According to Von Baer there are two species of lemming found in Nova Zembla, one of which he considered identical with the *Myodes hudsonius*.

“As the lemming is an Arctic animal, it must pass a longer night of winter than ordinary torpidity could survive. Some arrangement for a winter supply is therefore plainly necessary, and it is scarcely possible to conceive anything better adapted to the purpose than that described by Henderson.

“I have, therefore, no doubt in my own mind that the economic mouse of Iceland is a lemming; and as Greenland is the nearest point where lemmings have been found, I think it a fair conjecture, until rebutted by direct evidence, that the species found there is the American lemming, *Myodes hudsonius*.”

In accordance with this notion, Murray's map lxxv. (of the geographical distribution of the lemmings) represents Iceland as a lemming-country; and his map ci. (of the provinces of the terrestrial Mammalia) represents Iceland as a country with a Western or North-American fauna.

I cannot accept either these arguments or their results. Let us even admit provisionally that the account given us of these mice, that they collect great stores of food, and that they dig hollows for the preservation of this, for their dwelling-place, and also for their impurities, may apply in general to certain species of lemmings; there are nevertheless interwoven several particular circumstances which in my eyes prove that it does not relate to Rodents of this group, but must refer to such as belong to the same group as the common mouse. In the first place, both statements represent the principal food of this mouse as consisting of berries, especially *Arbutus*-berries; and the carrying of these home is indeed the object of its journeys. But the Arvicolines and lemmings are addicted chiefly to quite a different kind of vegetable food, as indeed is proved both by observation and by

the dental system; and even if a lemming may exceptionally feed on berries, yet these can never be its chief food. In the second place, there is the statement that the tails of these little sailors hang down in the water, nay, that they even perform their little voyage by using their tails as oars, whilst they sit upon the cowdung around the little heap of berries placed in the middle. But it is one of the general characters of an Arvicoline or lemming to have a short, stout body, and a very short tail; and as regards the species which Murray thinks must most probably be referred to here, *Myodes grænlændicus* or *M. hudsonius*, I need only refer to the well-known figures of this animal in Schreber's 'Säugethiere,' vol. iv. tab. 194-196. Both figures and text indicate the tail as so short (altogether only a few lines long) that it scarcely reaches beyond the body, not to speak of the margins of the rafts; and the animals certainly could not row the rafts with their tails. In the third place, the animal's whole mode of life is opposed to it; for, although I cannot lay very much stress upon the fact that one would rather expect the described position to be that of a mouse than of an Arvicoline or lemming, it may nevertheless be decidedly maintained that the Icelanders, who are so well acquainted and familiar with house-mice, could not for a single moment see in such short, stout Arvicolines, or, still more, lemmings, furnished with great fossorial claws, such a likeness to house-mice that they would mistake them for the latter. I should even strongly doubt, from my knowledge of the Icelanders, that they would give such different animals the same name.

I have already called attention to the misunderstanding which has taken place with regard to the colour given in English as *white*; it will be seen that Murray has built further upon this misunderstanding, and supposed that by it must have been meant either animals that were *albinoes*, or animals in a *white* winter dress; and in this case it would be most natural to think of the lemmings. Murray remarks correctly that Olafsen cannot have meant isolated albino individuals, as his "whitish" colour is ascribed to this mouse generally; but it has escaped him that Olafsen cannot any more have intended animals in a winter dress, as the collecting-journeys which he describes (no less than those of which Madame Benedictson had been a witness) must have occurred in the fine season!

If therefore, for the reasons given, it is not possible to make the above-mentioned description agree with the habits and mode of life of the lemmings, as the sketch decidedly calls up the picture of a true mouse, there remains the next



question, whether there is anything in the whole statement which cannot be applied to the mouse known to come from Iceland, which, as I have already stated, was named by Thienemann *Mus islandicus*, but which must certainly be regarded as a variety of our wood-mouse, *Mus sylvaticus*, Linn. But even this question I find myself in a position to answer decidedly in the negative. Everything agrees precisely with what we know of the wood-mouse.

In the first place I must remark that the geographical distribution presents no hindrance, as the wood-mouse is spread over the whole of Scandinavia, even up to Finmark, and therefore occurs under climatal conditions which at any rate are quite as severe, if not considerably more severe than those of Iceland.

In the second place, this mouse lives upon a food of the same nature, namely a mixture of fruits, nuts, and berries, and likewise collects great stores of them.

In the third place, it digs large store-chambers, dwelling-chambers, and impurity-pits for itself, exactly as described by Henderson (*vide supra*, p. 449) from the statements of the Icelanders.

As the last-mentioned circumstance is apparently a main point in the foundation of Murray's opinion, and is therefore in his work made prominent by italics, I shall not refrain from appealing to definite evidence; and for this purpose I reproduce, in their own expressions, what I find given upon the subject by two of the most accessible writers, Schreber and Nilsson, whilst I shall afterwards add a third piece of evidence from an author with whom I have not the same right to assume that Murray was acquainted.

In Schreber's 'Die Säugethiere,' vol. iv. p. 653, it is said of the wood-mouse (*Mus sylvaticus*, Linn.) :—

“They are very fond of taking up their abode under thickets and ruins. Their holes are from one-half to a whole ell under the earth, and consist frequently of two chambers, in one of which is the store of provisions, and in the other the mouse lives alone. The approaches are a perpendicular and oblique tube, in front of the opening of which no cast-out earth is to be observed.

“It feeds both upon corn and upon all sorts of wood-seeds, especially nuts, acorns, and beech-mast. Of these it carries in great provisions.”

Nilsson says of the same mouse, in his 'Skandinavisk Fauna,' pp. 348 & 349 :—

“In fields, woods, orchards, and the borders of fields it digs itself holes and galleries in the earth, or makes use of

such as are ready to hand, which it enlarges for its own convenience. Here it collects stores of *provisions*, consisting of acorns, fir- and spruce-seeds, nuts and berries, especially mountain-ash-berries, seeds, and juicy roots, which are sometimes accumulated in great quantity. It also peels off the bark from young trees and their roots, especially in winter, under the snow."

These quotations suffice to show that the wood-mice both collect provisions and have large holes for them, whilst they have others for their dwelling-place. But a still closer agreement with the statements given by Henderson will be found in the following short description of the mode of life of the wood-mouse, taken from Melchior's 'Den danske Stats og Norges Pattedyr' (pp. 102 & 103):—

"They live principally," he says, "in woods and gardens and also in fields on the borders of woods. Just under the surface of the ground they dig horizontal galleries, sometimes of half a score yards in length, from which smaller oblique galleries lead down to their domicile, which consists of two small cavities, one for a store-room, the other for the dwelling-place of whole families; and near this last there is again a peculiar small space for impurities, which they never deposit in the proper dwelling-place. Such a residence is commonly from half to one yard below the surface of the ground; but one sees no earth that has been thrown up from it or from the galleries. In winter they visit corn-stacks and sometimes barns.

"Their food, like that of the preceding, consists of corn, stone-fruit, &c., of which they collect a winter supply, but often without making use of it. They likewise eat like the preceding, sitting on their hind legs and holding the food between the fore feet."

We have here the store-chamber, the domicile, the impurity-pit (or cesspool), the long gallery, &c.; and we may lay all the more weight upon this description, if we remember that Melchior had particularly and through a long series of years studied the life of this animal, both in the woods and at home. I can further add, from my own observation, that earth thrown out or up is no more found near the holes of our *Mus sylvaticus* than near those of the Icelandic heath- or wood-mouse—a circumstance which has often struck me. We see from this how completely unwarranted Murray was in expressing himself as he has done at p. 269 (see p. 450):—"That an economic rodent lives in Iceland, is, I think, established; but the account given of its runs and granaries makes it not less clear that it is not *Mus sylvaticus*. There is no European mouse

that makes a nest in the manner described by Henderson." It may serve to excuse him, however, that the English faunists have possessed only an imperfect acquaintance with the subterranean home of the wood-mouse. We will here conclude with two of these which are particularly cited by Murray.

T. Bell, in his 'History of British Quadrupeds,' says expressly of *Mus sylvaticus*, Linn.:—"Each one laying up a winter store in its subterranean retreat, the devastations committed by it are considerable." And further:—"Its retreat is formed underground, either in holes formed by its own labour or more frequently in small natural excavations under the trunks or roots of trees, enlarged by themselves, or in the deserted runs of the mole. The quantity of food which is here hoarded is astonishing: it consists of acorns, nuts, corn, and various seeds, or even roots, &c."

Pennant also, in his 'British Zoology,' had already stated the same; for at p. 103 he says, with the addition of two lines from Virgil's Georgics:—"They feed also on nuts, acorns, and corn, forming in their burrows vast magazines of winter provisions.

"Sæpe exiguus mus  
"Sub terris posuitque domos atque horrea fecit."

It is perfectly clear that both were well acquainted with the enormous provision-chambers or "granaries" which the mice form, whilst they did not know much about their dwelling-place, galleries, &c. But even their provision-chambers also lead Murray into some confusion, inasmuch as at p. 266 he refers the mouse ("the long-tailed field-mouse") to which the passages just quoted from Pennant and Bell apply to the *Arvicolina*, probably because he calls these "voles" or "field-mice," and in a moment of inattention forgot that the "long-tailed field-mouse" of the above-mentioned authors is a true mouse and *Mus sylvaticus*, Linn.

By these observations I think all doubt is removed with regard to the question how far the reports of the Icelanders as given by Olafsen and Henderson can apply with any probability to any other Icelandic mouse than the one which we already know from Iceland under the name of *Mus sylvaticus*, Linn., or *M. islandicus*, Th. After this, Murray's map lxxix. p. 270, which represents the geographical distribution of the species of mice which live in the open, will have to be altered.

But as Murray's view is the clear expression of the thought that there probably lives in the interior of the country another mouse (an Arvicoline form, and most likely a lemming), which has hitherto escaped observation, and as, at any rate, in a letter

to me (for which I am much indebted to him, and in which he kindly replies to some epistolary remarks upon his hypothesis made with great brevity and only *en passant*) he has strongly affirmed the possibility of this, and at the same time urged me to obtain information from Iceland to clear up the matter, I may be permitted to add the following further explanations.

It is far from being the case, as some might perhaps think, that the statements given by the Icelanders to Olafsen and Henderson relate to a mouse living in the interior or very far from buildings. Madame Benedictson, when she was a young girl, would certainly not have amused herself for half a day in such deserts; and the wood of Husefell was and is a much frequented place\* through which a highway passes from Borgarfjorden; the situation therefore was such that the Icelanders had good opportunities of noticing the animals' proceedings; and Olafsen himself states expressly that travellers often meet with the store of provisions laid up by the mice. Moreover, how could it be possible for a mouse which lived far from dwellings, or far in the interior of the country, to obtain cowdung for its rafts?

On the other hand, it must not be forgotten that even if the animal that was the subject of these reports had been a lemming, it need not have lived in the interior: the very species of lemming that Murray thinks it might have been is not an inland animal, but occurs near the coasts.

Finally, it must be remembered that the interior of the country far from habitations is by no means unfrequented or unknown, and least of all the districts which still have an abundant vegetation of bushes and berry-bearing plants. Not to mention the journeys of the Icelanders and foreigners through a great part of the interior in passing from one principal part of the country to another, the roads between which, indeed, chiefly pass through uncultivated districts, I shall only say that I myself moved about the country with a tent for two summers, and often and for a long time remained far from houses, and that my travelling-companion Hallgrimsson has done just the same in other corners of the country. Neither of us saw the least trace of any animal resembling a lemming, or heard the Icelanders mention any such animal; and I must also add that our attention was already called to the subject in consequence of the discovery by Scoresby of a *Hypudæus* or *Lemmus* on the east coast of Greenland.

\* It is frequented by people from nearly the whole of Borgarfjorden, who obtain from it birch wood for charcoal and for building-purposes. (Smlgn. Eg. Olafsen, i. pp. 167, 168.)

Thus also we get rid of every reason for placing Iceland in the map\* as belonging at present to the circle of distribution of the lemmings, and likewise for placing it among the countries which have a western or American fauna of terrestrial mammals†; for, provided the Iceland mouse is to be regarded as a terrestrial mammal of the island before its peopling, there cannot be the least shadow of doubt that, like the species of *Helix* and the other land and freshwater mollusca, with the whole of the land flora, it points towards Scandinavia and Lapland, and removes the island from Greenland and North America. It was also in opposition to this *eastern* type in the existing flora and fauna of Iceland that the distinctly expressed *western* or *American* type which I found in the Icelandic Tertiary flora of the Surturbrands had already struck me as so remarkable.

But these discussions lead in the end to a pressing request to the Icelanders that they will send to the Zoological Museum from different districts of that great island the mice living in the open country and far from human habitations, especially preserved in spirits; for, although there is no particular reason for supposing that there would be among them forms which we do not already know, still several important scientific questions attach to this mouse:—first and chiefly whether the definite peculiarities upon which it has been thought that it might be set up as a peculiar species, or a peculiar Icelandic variety of another allied mouse, are always present; and next, whether, if this be the case, these peculiarities can be supposed to have been developed in Iceland, or whether they also occur elsewhere and may have come thence with the mice to Iceland.

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#### BIBLIOGRAPHICAL NOTICE.

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8vo, pp. 120. Dublin and London, 1868.

WHEN the Hebrew sage gave expression in his native language to a view of creation and cosmogony according to the wisdom of the Egyptians, he began his divine mission by withdrawing his people from the superstitions of ignorance and fear, and fixing their attention on the one omnipotent and omniscient Creator. What remains

\* See map lxxxv., p. 266, of Murray's work.

† See Murray's map ci., p. 308. If the synonymy given by Murray be correct, and *Myodes granlandicus* be really identical with one of Pallas's species from Siberia, this will prove that this lemming's occurrence in Iceland would just as well indicate an eastern as a western fauna for that island.